The Nature Conservancy
Protecting nature. Preserving life.™

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Thank you for the opportunity to comment on the update of the *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies* as required by Section 2031 of the Water Resources Development Act of 2007 (WRDA 2007).

The Nature Conservancy is an international, nonprofit organization dedicated to the conservation of biological diversity. Our mission is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. Our on-the-ground conservation work is carried out in all 50 states and in 30 foreign countries and is supported by approximately one million individual members. The Nature Conservancy has protected more than 117 million acres of land and 5,000 miles of river around the world. Our work also includes more than 100 marine conservation projects in 21 countries and 22 US states.

As the Conservancy has increased its engagement in a variety of restoration projects, the Corps of Engineers has become an important conservation partner. Together, the Conservancy and the Corps are working on a variety of projects ranging from large-scale efforts in the Upper Mississippi River and Everglades to smaller scale projects under continuing authority programs. Based on the number of projects, the Conservancy is now the Corps' largest non-federal sponsor of ecosystem restoration projects, with collaborations on wetland restoration, dam re-operation, dam removal, levee setbacks, floodplain restoration, and oyster bed restoration. It is this experience and more than two decades of advances in science and engineering since the existing Principles and Guidelines were put in place that we drew upon in writing these comments. These comments on revision of the Principles and Guidelines are intended to help the Corps and other enacting agencies to more effectively and efficiently manage water and associated land resources to address needs such as flood risk management, water supply, food and energy production, and navigation while meeting some of the nation's most critical and challenging environmental problems.

The ultimate goal of this update should be to move away from a water resource policy focused primarily on economic development and to a more comprehensive approach that seeks to balance multiple watershed needs. The revision should set clear policy goals to ensure such a balanced approach is achieved. The policy set forth in Section 2031 of WRDA 2007 provides a useful framework. The three-pronged policy, which places equal emphasis on *sustainable* economic development, minimizing the unwise use of floodplains, and protecting and restoring natural systems should be explicitly reflected in the revised Principles and should guide the analysis of all water resource projects.

Within the context of balancing watershed needs, and in particular balancing ecosystem protection and restoration with economic development, our comments below focus on the following broad themes:

I. An integrated and analytical process for revising the Principles and Guidelines
II. Better incorporating ecosystem restoration and impacts into the project planning and evaluation process
III. Providing incentives for non-structural approaches to flood risk reduction
IV. Using a watershed approach in the planning and implementation of projects
V. Adaptively managing water resource projects

I. Process for Updating the Principles and Guidelines

The Conservancy believes that this update is critical to improving the planning and implementation of water resource projects for the coming decades and provides an important opportunity to build on lessons learned in river basin management, flood risk reduction and ecosystem restoration. It is also an opportunity to balance multiple needs in our watersheds and to take a more holistic approach to water resources.

Because revising the Principles and Guidelines provides an unparalleled opportunity to ensure the long-term sustainability and viability of water resources in the United States, we strongly recommend that the revision be accomplished through an analytical, integrative and inclusive process that ensures that the end product reflects the nation's water resources priorities and effectively guides federal agencies toward meeting those priorities. Such an approach can provide a forum for discussing and articulating a vision for the nation's water policy that builds on Section 2031 of WRDA 2007, which requires that the Principles and Guidelines be consistent with an overarching consideration of sustainable economic development, the avoidance of unwise use of floodplains, and the protection and restoration of natural systems. Newly revised Principles and Guidelines must move federal water policy toward consistency with these important goals. This revision process cannot demonstrate consistency with these overarching priorities without thoroughly analyzing how current policy is compatible or incompatible with these policies.

Beyond the overarching policy goals in Section 2031 of WRDA 2007, the statute introduces multiple concepts that can only be addressed through an inclusive, integrative and analytical process. For example, Section 2031(b)(3) requires that the Principles and Guidelines address several complex concepts such as adaptive management, integrated water resources management, best available economic techniques, and the value of nonstructural approaches. These are multifaceted issues, and revising the Principles and Guidelines to incorporate them can only be accomplished through a process that assesses the extent to which the current Principles and Guidelines address these issues and, if not, how this update can best incorporate these concepts.

Given the complex and critical nature of this update, we recommend a revision process that would:

1) Provide a clear opportunity for public comment and a timeline that allows for meaningful integration of public concerns and priorities;
2) Include comprehensive integration of the experience and expertise of other federal agencies (Although the current WRDA language indicates that the revisions will apply to Army Corps of Engineers projects, the current Principles and Guidelines also provides the overarching water development policy for the Department of the Interior, the Department of Agriculture and the Tennessee Valley Authority. A revised Principles and Guidelines will undoubtedly influence these other agencies at some point in the near future and thus these agencies should have a significant role in their revision);
3) Be thoroughly informed by research that assesses the current state of the nation's water resources;
4) Clearly synthesize the strengths and weaknesses of the current Principles and Guidelines; and
5) Consider future trends so that the revised Principles and Guidelines can be responsive to dynamic future needs.

The deliberative approach described above is consistent with past efforts at crafting federal water policy. The policy that preceded the Principles and Guidelines, the Principles and Standards, were developed based on a report, "Water Policies for the Future," which was developed by the National Water Commission with the help of the Water Resources Council and was based on a five-year effort that included numerous commissioned research products. This research program outlined the current state of the nation's water resources and provided an information base from which to develop federal policy. Because the Principles and Standards were developed by the Water Resources Council, composed of several federal agencies, the process inherently included significant integration between federal agencies. In addition, later revisions of the Principles and Standards and the formulation of the Principles and Guidelines involved extensive interagency and interdepartmental coordination and resources, as well as extensive collection of background studies and information on the state of water resources as well as expert and public commentary.

The revision of the Principles and Guidelines provides the nation with a clear opportunity to articulate federal policy and priorities for water management. Given that, we urge the Corps to undertake a careful and analytical process and to gather the information, expertise and stakeholder input that is necessary to understand shortcomings of the current Principles and Guidelines and to develop forward thinking policy that incorporates the latest knowledge in river basin management, ecosystem restoration and protection, and engineering.

II. Protecting the Natural Environment

The past century has witnessed a precipitous decline in the ecological health of most of our nation's rivers and streams. Much of this decline is the unintended consequence of federal water development projects designed to provide public benefits such as flood

control, water supply, hydropower, and irrigation. As a result, water management actions frequently conflict with policies such as the Endangered Species Act, often leading to contentious and polarized conflicts. Further, rivers—along with the floodplains and estuaries that are sustained by rivers—provide immense values to society in the form of *ecosystem services.* The value of these ecosystem services, including water filtration, attenuation of flood flows, and productive fisheries, have been previously overlooked but represent an essential component of our nation's long-term economic sustainability and security.

Recognizing the impacts of decades of water resource projects, Congress modernized the Corps' Civil Works mission over two decades ago to include ecosystem restoration. It is now time to update the planning process to place ecosystem protection and restoration on par with economic return when evaluating and implementing water resource projects. We believe that the policy changes described below are critical for achieving sustainable water resource management, which will reduce or avoid future conflicts and help rebuild the ecosystems, and associated services, that support our nation's economy.

Comprehensive Analysis of Project Impacts and Benefits

Section 2031 of WRDA 2007 places *equal* emphasis on sustainable economic development, minimizing the unwise use of floodplains, and protecting and restoring natural systems while mitigating unavoidable impacts. However, under the current Principles and Guidelines, maximizing National Economic Development (NED), which only accounts for a narrow subset of a project's full economic benefits and costs, has become the primary standard for evaluating water resource projects. This NED focus places impacts and benefits to environmental quality as a secondary concern in project planning and ranking. Furthermore, this bias toward NED results in project decisions that ensure economic return, but the current process does not require the necessary analysis to determine whether projects are the most environmentally beneficial or sustainable.

Instead of selecting projects that have multiple benefits, the NED focus drives decision-making towards projects that may have the highest benefit cost ratio for a single purpose but are not necessarily the most environmentally and economically beneficial when a more comprehensive analysis is undertaken. To address this deficiency, the Principles and Guidelines should be revised to apply a more comprehensive analysis of project benefits and costs. Not only should the NED account incorporate a broader array of economic values, including ecosystem service values, but other accounts, that include non-monetary project benefits, should receive equal weighting as the NED. These reforms will promote projects that meet water resource goals while protecting and restoring aquatic ecosystems.

Ecosystem Services

Many of the services provided by functioning ecosystems have quantifiable economic value (e.g., flood storage capacity of floodplains, filtering capacity of wetlands).

However, because the NED generally doesn't include the value of ecosystem services and the environmental quality account focuses on non-monetary values, the gain or loss of such services are often not properly accounted for in project planning and ranking. To truly evaluate the impact of a given project, the loss or gain of ecosystem functions and services should be explicitly evaluated in both monetary and non-monetary terms. Monetary value should be determined, where possible, and incorporated into the NED analysis. Furthermore, to ensure long-term sustainability, there should be an overall standard of no net loss of ecosystem functions and services that should be applied to all projects based on the non-monetary evaluation of ecosystem impacts.

Multiple Purpose Projects

A symptom of the issues described above is that the current planning process does not accommodate projects that have multiple purposes. The process forces such projects to choose a primary purpose, allocate costs to each project purpose, and then compares the multiple purpose projects to other projects with the same primary purpose, effectively ignoring the additional benefits of a multiple purpose project. As we become more aware of the ecological impacts of water resource development as well as the benefits that healthy ecosystems provide, it is important to ensure that projects that meet multiple goals become the norm rather than the exception.

The flaws of the current approach to multiple purpose projects can be seen on a project the Conservancy has partnered on in the Sacramento River watershed. The project will build a setback levee and restore Sacramento River floodplain, providing both flood protection and ecosystem restoration. In allocating costs for the project, the cost of the first few feet of the new levee are allocated to ecosystem restoration while the remaining are allocated to flood control. When competing for funding, this project is compared only against other flood risk reduction projects based on a benefit-cost ratio that is calculated purely on the project's monetary flood control benefits. As a result of forcing this project to be compared with other purely flood control projects, it does not rank well because the comparison only accounts for a portion of the total project benefits. Likewise, this same comparative process also results in this project not ranking as high as strictly ecosystem restoration projects because only a portion of project benefits are evaluated when comparing ecosystem restoration projects. Therefore, if we are to see more of these innovative, win-win projects, we must improve the planning and evaluation process to fully account for all the water resource goals a project may fulfill and not pigeon-hole such projects into a single project purpose, discounting the true value of the project.

Analysis of Ecosystem Impacts

The Principles and Guidelines update should implement a more robust analysis of the ecosystem impacts and benefits of water resource projects. In practice, the Principles and Guidelines often only subject projects to the very narrow test of whether the selected alternative impacts threatened or endangered species or other protected resources and whether those impacts can be offset. Such an approach is not sufficient to ensure that we

maintain the health of our nation's aquatic resources and the many important services they provide.

Criteria that could be evaluated when determining the environmental quality impacts of a project include:

- Habitat impacts and benefits
- Species and communities impacts and benefits
- Biodiversity significance of both impacted areas and potential mitigation
- Potential for restoration of lost habitats through analysis of hydrology, soil type, etc.
- Loss or gain of ecosystem function and services of a given project and in the event services are lost, the ability to restore those services elsewhere

Recommendations

- To remain consistent with the policy set forth in Section 2031 of WRDA 2007, the Principles and Guidelines should be updated to ensure a comprehensive analysis of all project benefits and costs. This analysis must be much broader than the focus in the current NED analysis on a narrow set of monetary costs and benefits.

- The narrowly defined NED analysis in the current Principles and Guidelines should be expanded to accurately capture economic benefits provided by ecosystems and the economic costs of ecosystem impacts.

- A standard of no net loss of ecosystem functions and services should be applied to all projects.

- NED should become one of multiple equally-weighted criteria in planning and ranking projects. Non-monetary benefits or costs (e.g., ecosystem impacts, risk) should be considered equally in project planning.

- To accommodate for multiple purpose projects, requirements to allocate costs and benefits to single project purposes should be removed. In addition, all benefits and costs of a multi-purpose project should be evaluated instead of comparing a portion of a multiple purpose project's benefits to other single-purpose projects.

- The update of the Principles and Guidelines should incorporate a more comprehensive analysis of project impacts to a suite of species as well as their habitats and associated ecosystem processes. To accomplish this, the Principles and Guidelines should be updated to reflect the most current science in conservation and ecosystem restoration.

III. Providing incentives for nonstructural approaches

Nonstructural approaches to water resource projects (e.g., floodplain and coastal restoration, land buyouts to remove vulnerable structures and prevent inappropriate development) can often be the most effective solution for reducing flood risk and controlling erosion and generally have numerous advantages over structural approaches (e.g., levees, floodwalls, and bulkheads). These advantages include lower long-term maintenance costs, a greater range of benefits (e.g., recreation and habitat on floodplains and natural shorelines), and far lower "residual risk"—the risk to life and property that remains should a project, such as a levee, fail during a flood. Further, nonstructural approaches are generally very compatible with environmental protection and can even be an important strategy for achieving ecosystem restoration.

Unfortunately, these approaches are rarely used. The Principles and Guidelines do not currently provide any incentives for nonstructural approaches. In fact, the term "nonstructural measures" in the current Principles and Guidelines is defined as changes in policy, management, regulation, or pricing. This narrow definition does not accurately reflect the current meaning of the term, and illustrates the need to update the Principles and Guidelines to ensure that nonstructural measures are better incorporated into the planning process and are given priority in selecting project alternatives.

As highlighted above, the focus on NED in project selection also creates a bias against nonstructural approaches by not effectively considering other project benefits beyond direct economic return. For example, a levee built on the river's edge is likely to be ranked equal to or above restoration of the natural floodplain or use of a setback levee when compared solely on the basis of the economic value of property protected from the flood risk reduction measures. The Principles and Guidelines should be broadened to ensure that such a narrow evaluation of benefits does not preclude nonstructural approaches.

In addition to improving the accounting of benefits for nonstructural approaches, the Principles and Guidelines should also ensure that the evaluation of project alternatives accurately reflects long-term costs and risks. For example, non-federal cost-share partners are responsible for projects' operations and maintenance (O&M). However, local budgets for O&M often only plan for basic maintenance, such as mowing, and do not anticipate the full O&M costs which include major repairs, rehabilitation and replacement over the life of the project. Risks to communities, and to the nation's taxpayers in general, increase when local cost-share partners fail to meet their true O&M obligations over time for structural projects, as often happens. In contrast, nonstructural projects generally have very low O&M costs over time with no need to eventually rehabilitate or replace an expensive structure. The relative advantages of nonstructural alternatives will be more apparent if the revised Principles and Guidelines compel more accurate accounting of true long-term costs.

Further, structural projects for flood control often result in high levels of "residual risk". Previous accounting methods had assumed that property protected by levees designed to

withstand the "100-year flood" carried no further risk from flooding. However, as has been seen countless times in this country, properties protected by levees still face considerable risk if and when the levees fail or their design capacity is exceeded by a flood. The concept of "residual risk" considers this remaining vulnerability. In contrast to structural projects, nonstructural approaches, such as buyout and relocation, result in little or no residual risk. Further, risk should be calculated against multiple accounts, not just NED, to address the full range of risks that society bears. The Corps is beginning to use a new method, the "risk-informed decision framework," that considers risk more holistically and also accounts for residual risk. We strongly encourage the revisions to the Principles and Guidelines to provide further support for more accurate, holistic, and responsible calculations of risk. Such approaches to risk analysis will further highlight the relative advantages of nonstructural approaches.

Finally, greater incentives for nonstructural approaches can help ameliorate a persistent challenge in flood-risk and coastal zone management: local decision makers largely control land use, but the nation at large bears the risks and pays the consequences for these decisions. Local decision makers often favor structural over nonstructural approaches because they allow an increase in short-term economic gain, even as they potentially increase long-term risks and costs. The more accurate accounting of benefits, costs and risks described above should bolster nonstructural approaches, but may not be sufficient to counter decision making driven by short-term interests at the expense of long-term costs. The revised Principles and Guidelines should strive to provide further incentives and policy guidance that can compel more economically rational long-term decision making at all levels of government. For example, the Principles and Guidelines should state that nonstructural approaches must be considered first, and that structural approaches can only be considered if a nonstructural alternative is not feasible. The multiple advantages of nonstructural approaches—lower O&M, low or no residual risk, diverse benefits, and consistency with environmental protection and restoration—provides a strong foundation for such a policy.

Recommendations

- Redefine the term "non-structural measure" in the Principles and Guidelines to encompass the current meaning of this term

- Create incentives for selecting non-structural approaches to water resource issues and remove biases, such as the focus on National Economic Development (NED) in the current Principles and Guidelines

- Ensure that the comparison of project alternatives accurately reflects projects' true long-term costs and full risks.

- Require that nonstructural alternatives be considered first, and that structural alternatives can only be considered if a nonstructural approach is proven infeasible.

IV. Watershed Approach

The Principles and Guidelines should be updated to ensure that water resource planning can be carried out at scales that allow for multiple demands to be met most efficiently and effectively. Planners must be able to incorporate disparate interests such as navigation, flood risk management, water supply, and restoration and protection of the environment into all projects. Evaluating projects individually with little consideration of how a project fits into larger watershed goals results in projects that may be justified based on the benefits of the project at its particular location but do not make sense when evaluated in the context of a larger watershed. Therefore, the Principles and Guidelines should seek to ensure that broader watershed goals are considered when evaluating projects.

To implement a watershed approach, planners should be able to rely on existing plans and data (e.g., formal watershed plans, state wildlife plans, water supply plans) to inform whether a given project is consistent with other goals for a watershed. Furthermore, planners should collectively consider multiple water resource needs, such as flood risk management, navigation and ecosystem restoration, when evaluating a project and not focus solely on comparing projects within one business line or project type. Comprehensive watershed studies that the Corps has undertaken, such as those on the Yellowstone and Upper Mississippi Rivers, provide a good model for how to incorporate multiple watershed needs into project planning and development based on a holistic watershed approach. Moreover, these studies have taken the critical step of engaging multiple federal and state agencies and other stakeholders in assessing watershed needs and setting water resource priorities.

Recommendations

- Update the Principles and Guidelines to ensure a watershed approach is undertaken in water resource planning. A watershed approach should involve a consultation of existing watershed data and plans, an analysis of how a project meets or is consistent with broader watershed goals, and engagement of other federal and state agencies and outside stakeholders.

V. Adaptively Managing Projects

Despite the best planning and modeling, management of water resource projects needs to be periodically updated based on new information, understanding, and circumstances. This good practice will be increasingly important with climate change, which has already begun to influence meteorological and streamflow patterns and is calling into question many base assumptions about future project conditions. Accordingly, projects must be adaptively managed to allow operational flexibility and the ability to respond to changing conditions. Successfully implementing an adaptive management approach requires setting goals and objectives during the initial project planning, a significant investment in monitoring and data collection so that change over time can be observed and incorporated into management strategies, an evaluation of whether the project has met its goals, and

when necessary, the design of corrective management actions. This approach should be a component of the planning for all projects.

The planning process must be flexible enough to allow for an expedited mechanism for gathering new information and designing changes to a project that remain within the project's authorized purposes. These types of changes should not require the same level of analysis and process as would a new project. The Principles and Guidelines should be updated to allow for minor project changes to adapt to changing water resource conditions.

Climate change increases the importance of adopting an adaptive management approach for water resource projects. Because changing patterns of runoff, water availability and flood risk may dominate water resource management in the future, the revisions to the Principles and Guidelines needs to include an assessment as to how planning policies can contribute to water management that is sustainable and resilient in the face of climate change. All projects should include an analysis of potential climate change impacts to future project conditions.

Recommendations

- Create mechanisms in the Principles and Guidelines to enable efficient adjustments to water resource projects in an adaptive management context.

- Require analyses at appropriate scales to incorporate into project planning the potential impacts of climate change on a water resource goals and projects.

Thank you for the opportunity to comment. If you have any questions, please contact Jason Albritton, Senior Policy Advisor for Water Resources (jalbritton@tnc.org; 703-841-4105).